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FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

IS Budget Growth Slides

Spending on systems and staff
grows slightly as users streamline
their IS strategies



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IBM's Fixed Price Service Pitch

How To Hire the Right Programmer

Phone Mail Gets Stamp of Approval

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FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE



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Cover Photography by Walter Wick

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The Importance of Research

Research has been a hallmark of DATAMATION almost from its inception in 1957. Through the years the magazine has tracked the growth of the worldwide information technology industry in various ways—measuring the revenues of the top 100 IT suppliers, gauging salaries of IT professionals, partnering with Cowen & Co. to track PC, mini-computer, and large-scale systems sales, among other things. Perhaps no single research effort is more important, however, than our annual IS budget survey. It tells you how much your peers are spending on hardware, software, services, and personnel—important knowledge to have in these competitive times, when IS outlays for equipment constitute nearly half of all business investment. This year's analysis, "IS Budget Growth Drops," begins on p. 18.

That the growth of IS spending has slowed in the U.S. will hardly surprise anybody. Users polled by DATAMATION indicate they'll only invest 4.4% more in their IS operations this year than they did last year, when IS outlays increased by nearly 8%. But don't dismay, says Parker Hodges, who collaborated with DATAMATION research manager Laraine Donisi in preparing this year's survey. "Despite the downward trend, it seems to me that people are getting a lot more bang for the bucks they're forking over for systems and networks," Hodges says, noting that users expect their IS investments to yield a 36% increase in processing power for their organizations in 1989.



NUMBER CRUNCHERS Hodges and Donisi tote results.

"The most interesting thing we did in this year's study," explains Hodges, as he looks over four tomes of budget numbers, "was to ask the questions in a way that would yield information our readers could use on a truly competitive basis." For the first time, the seven-year DATAMATION veteran points out, the research team went to the effort of categorizing results for three different sectors of the economy: manufacturing, services, and public. This analysis gives users a clearer picture of IS spending trends than in the past. "A couple of years ago," Hodges recalls, "I got a call from an IS exec on Wall Street who thought his head count was too high because it was well over the mean for personnel outlays. When I explained to him that government hiring practices tended to skew this number downward, he was relieved. I don't expect to hear from him this year."

A Forum for Technology of Significance

Research of another kind also has distinguished DATAMATION for more than three decades. The publication, originally a spin-off of *Research & Development* magazine, has long enjoyed a reputation as the preeminent place for industry experts to publish their research and thinking on IT topics of our times. Continuing that tradition, senior editor Linda Runyan has created a new arena for users, vendors, and professional researchers to voice their opinions on important subjects. Premiering this issue is Technology Forum (p. 25), which will become a quarterly feature in DATAMATION. As the subject of our first Technology Forum, Runyan has chosen the most fundamental challenge facing IS execs as they race into the 1990s and the next millennium: software development. We'd also be happy to hear your thoughts on the subject.

Tim Mead

—Tim Mead, Editor-in-Chief

DATAMATION

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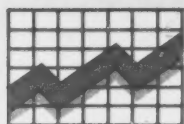
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IS BUDGET GROWTH SLIDES

This year, IS executives will manage more cash than ever before. But corporate streamlining and smarter working mean IS budgets won't be rising as quickly as in the recent past.

BY PARKER HODGES





Optimism is tempered by a realistic view of the pressures at work in U.S. business. This has led to the lowest growth in IS budgets since 1985-86.

Optimism about the health of their companies is the note most often sounded when the results of DATAMATION's most recent annual budget survey are played back. A cross section of CEOs, financial officers, and IS veeps and managers told DATAMATION they're happy about George Bush's win, they're glad the dollar has crept up, and they welcome the trend to corporate streamlining. Most importantly, perhaps, the great majority don't expect a recession in 1989. These executives and managers expect the total revenues of their companies or organizations to be up 9.3% in 1989. But for IS organizations, optimism is tempered by a realistic view of the pressures at work in U.S. business. A new scrutiny has led to the lowest growth in IS budgets since 1985-86.

The companies in the survey are building from strength: the average 1988 revenues of those polled easily topped \$1 billion, coming in at \$1.4 billion. Services companies averaged \$773 million, manufacturing companies averaged \$1.6 billion, and the average total budgets of the public or government organizations polled approached \$1.3 billion. In 1989, the respondents expect their revenues or total budgets to average \$1.13 billion.

The slices of these big bucks that end up on IS's plate make for impressive numbers. The average 1988 IS budget among those polled was \$1.8 million, ranging from \$1.6 million in services and \$1.9 million in manufacturing to \$2.7 million in the public sector. For 1989, services companies say they'll spend \$1.7 million; manufacturers will spend a bit more than they did in '88, still rounding to \$1.9 million; and the public sector will average \$3 million.

While these are considerable sums, the effects of corporate streamlining and budgetary squeezes have in fact meant that, in most cases, IS is getting a slightly smaller piece of the total pie. Among those polled, in 1988 the average services company spent 2.1% of its revenues on IS; in 1989 IS's cut is down to 2%. At manufacturing companies, 1988's already stringent 1.2% will drop to 1.1% in 1989. The exception is found in public organizations; here, it took 2.1% in 1988, while in 1989 it will climb to 2.3% of the total budget.

In dollars, though, the direction is up. The average 1988 IS budget is \$1.82 million; for services companies the average is \$1.62 million; for manufacturing companies, \$1.91 million; and for the public sector, \$2.72 million. Result: taking the survey population as a whole, 1989 will see an average IS budget of \$1.9 million, only 4.4% above 1988's budgets (see "The Shape of the Change").

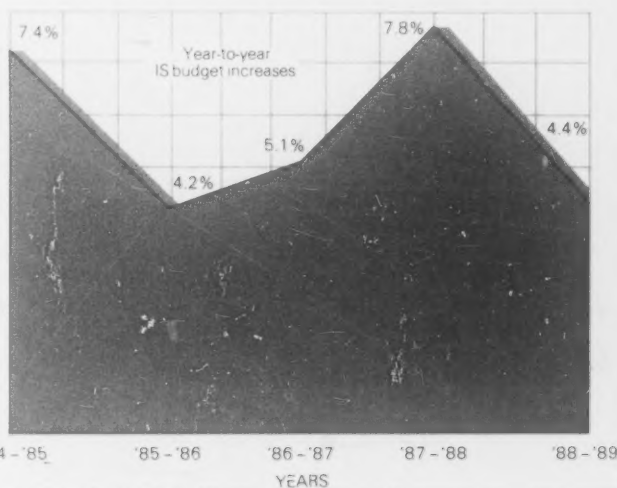
Across the board, this means an increase of a bit less than 1% in the number of staff reporting directly to IS. About 37% of those polled expect to have larger IS staffs in 1989 than in 1988. Asked to name the reason for the increase, about half of that group cite the development of mission-critical applications, and more than a third happily report that there has been new recognition of IS's crucial role in the future success of their companies or organizations. Another sizable group, about a quarter of those expecting staff increases, say that new IS responsibilities, especially for communications functions, would cause growth.

Some respondents—about 6%—say that larger staffs will be needed because their organizations are recentralizing certain IS functions.

In one sector, not always known for its tight grip on a dollar, there seems to have been some success in holding down personnel costs. The public sector is the only one in which personnel costs are lower than costs for hardware and software. In 1988, personnel took 40.5% of the average public sector IS budget, and hardware and software took 41.5%. And public sector IS managers plan to do even better in 1989:

The Shape of the Change

A group of optimistic CEOs and other top managers are keeping a tight rein on budgets for 1989.



only 39.8% of public IS budgets are earmarked for personnel, compared to 43% for hardware and software. By contrast, the private sector is almost a mirror image reversal: 1989 personnel costs will hover near 44% of IS budgets and hardware and software will take a bit under 37% (see "How the Pie Is Divided").

Effects of Streamlining

This year, the DATAMATION budget survey also asked respondents to decide whether the pressures they feel are having "positive" or "negative" effects on their organizations. Almost a third of respondents—31%—say that corporate streamlining would have a positive effect, confirming the theory that technology is an "enabler" for such streamlining. Fewer than half as many—12.3%—say that streamlining would have a negative effect. But in response to a slightly different phrasing of the question, only 9.8% say that "downsizing trends" would have a positive effect on IS; 13.5% say that downsizing would have a negative effect. The most feared possibility, named by 27% of the respondents, is higher inflation and the increased interest rates that would bring.

Some respondents will bear the brunt of streamlin-

ing pressures. About 8.6% of those polled say they expect to run smaller IS staffs in 1989 than in 1988. Half blame "budgetary squeeze" for the cuts. Three other reasons cited by about a quarter of this group are: consolidation due to mergers and acquisitions or reorganization; increased productivity among the remaining IS employees; and a shift toward distributed processing.

Along with distributed processing has come distributed responsibility. About 46% of the respondents say that their companies have people with IS responsibility who do *not* report to dp/MIS. (About 20% of those answering the survey did not respond to this question.) While there is almost no change from 1988 to 1989 in the number of organizations where this trend is apparent, there appears to be a marked increase in the number of non-IS individuals at these companies with IS responsibilities.

Surveying all sectors, in 1988 the mean number of people with IS responsibility was 13.2; in 1989 it rises to 14.6. The biggest jump is taking place in the manufacturing sector. Last year, 13 non-IS people had IS responsibilities; this year, 17.1 non-IS people have such clout, with the biggest jump occurring in the process industries.

Still, some respondents claim a more traditional division of responsibilities: about 35% say all IS responsibility resides in the IS department, with insignificant change from last year to this year. The largest group of traditional companies is found in the services sector, where about 40% have just said no to distributed IS responsibilities. About 25% of public organizations and about 30% of manufacturing companies also report no IS responsibility outside IS.

In this day of PCs, workstations, and end-user computing, different numbers obtain when it comes to shopping for IS equipment: only 30% of all respondents report that no one outside IS has purchasing and specifying authority over IS purchases (see "Spotlight on the Hardware Store").

Non-IS people in the public sector have the most

Micros Take Leaner Slice of IS Purchases

With micro mania fading slightly, micro software and LANs are taking a bigger piece of the IS purchase budget.

	1988	1989 Estimate
Processors		
Personal/microcomputers	33.1%	29.1%
Workstations	4.7%	5.2%
Minicomputers	7.5%	8.0%
Super/minisupercomputers	2.4%	3.0%
Mainframes	4.7%	5.3%
Peripherals		
Memory/solid-state systems	1.4%	1.6%
Disk subsystems	3.2%	2.9%
Tape subsystems	1.1%	1.1%
Printers	6.5%	6.0%
Terminals	3.1%	3.0%
File servers	0.7%	1.0%
Communications		
Private networks (including leased lines)	2.1%	2.4%
Switched & value-added networks	0.5%	0.4%
Local area networks	1.7%	2.3%
PBX	0.7%	0.4%
Other	0.7%	0.3%
Systems Software (if purchased unbundled)		
	4.6%	4.9%
Applications Software		
Personal/microcomputer	10.7%	12.6%
Workstation	0.9%	1.0%
Minicomputer	2.6%	3.4%
Super/minisupercomputer	1.0%	0.9%
Mainframe	3.0%	2.3%
Other	3.1%	2.9%
	100.0%	100.0%

Spotlight on the Hardware Store

Confirming a trend first identified last autumn by DATAMATION's Mini/Micro Spending Survey (see "The Purchasing Outlook," Nov. 15, p. 18), microcomputers are taking a smaller share of the IS hardware dollar than in the past. In 1988, almost a third of every dollar—33.1%—spent on information systems purchases went to buy personal or microcomputers. In 1989, the PC share is down to 29.1%. Big drops are reported across the board: the public sector spent 31.9% of its IS purchase budget on PCs in 1988; this year it will spend 27.4%. And, in the private sector, PC spending will fall to 29.5% of purchases in 1989 from 33.4% of purchases.

Call an end-user machine a workstation, however, and the trend points the other way, with 1988's 4.7% of the purchase dollar rising to 5.2% in '89. In the manufacturing sector, workstation acceleration is even more apparent: in 1988 4.1% of the IS purchase budget went for workstations; in 1989 respondents predict they'll spend 5.7% on workstations.

The midrange results are mixed. In the public sector, last year

was a lean year for minis, consuming only 6.6% of purchase dollars. This year, by contrast, fully 12% of public sector IS purchases will be minis. The reverse is true, though less dramatically, in manufacturing: in 1988 11.2% of purchase dollars went for minis; this year 9.6% will go for minis. Services companies stayed fairly flat, moving slightly up from 5.6% to 5.9%.

Minisupers and supercomputers are also taking more purchase dollars. Overall, the mean percentage of the purchase budget going for minisupers and supers rises from 2.4% to 3%, with the biggest increase occurring at manufacturing firms, where the mean rises from 3% to 4%. Respondents in the computer and electronics industries are the big spenders here: 8.3% of purchase dollars are headed for minisupers and supers in 1989.

Mainframes are up, but only slightly. In 1988 the big machines took an average of 4.7% of purchase budgets. In 1989 they'll consume 5.3%, with big increases in the buying plans of transportation companies; food, entertainment, and travel companies; and the federal government and educational institutions.

influence; where only about five non-IS people per company in services or manufacturing have buying and specifying authority, organizations in the public sector report that in 1988 an average of 17 people had such power in each public sector organization.

Still, the survey shows that about 77% of all information technology systems, software, and services is directly purchased by central IS. About 23% of total systems, software, and services is being bought by business units or departments within the business units.

Despite moves to more strategic use of information technology, the back office still takes the lion's share of IS's capabilities, consuming an across-the-board mean of 49.3% of resources. Engineering and research applications consume a mean of 11.2%; manufacturing applications, 8.6%; marketing and sales, 12.8%; distribution, 5.2%; and "other," 13%.

Taken across the entire surveyed population, these particular statistics can be misleading. Only when separated does a true picture of IS activities emerge. At services companies, back office and administrative chores typically consume 51.8% of IS resources. In public organizations, the back office chews up even more, 56.8%. At manufacturing companies, however, the back office's cut drops to an average of 38.4%. Engineering and research also show marked differences between sectors, with services companies spending 9.8%, public organizations 12.8%, and manufacturing firms 14%.

The biggest difference is in the share of resources devoted to manufacturing; services companies use just 3.1%; the public sector even less at .3%; and the manufacturing sector weighs in with a mean response of 25.6%.

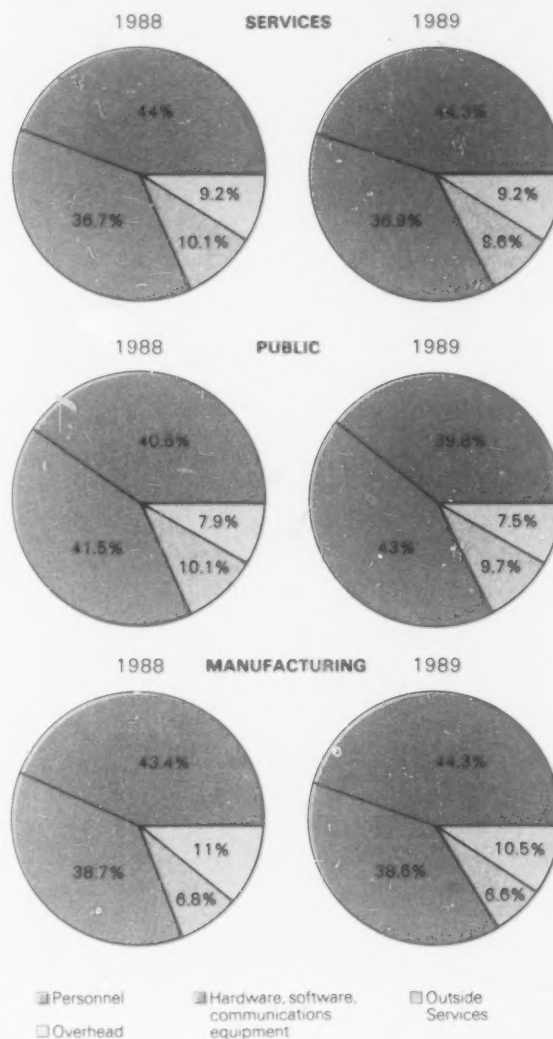
Marketing and sales applications also show marked differences between sectors, with the public sector using just 2.9% of its resources here. Services companies at 13.7% and manufacturing companies at 15.4% are much closer to one another.

In applications for distribution, services companies are the big users, devoting 6.3% of resources,

with the public sector and manufacturing almost tied at 3.6% and 3.5%, respectively. The ever present "other" category finds the public sector devoting almost one-quarter of its power here; and "other" applications require that services use 15.3% and manufacturing 3.3% of their resources.

How the Pie Is Divided

IS in the public sector has the lowest overhead and personnel costs; manufacturing companies use the fewest outside services; and services companies spend the least on purchases.



Source: DATAMATION

Methodology

On November 11, 1988, 3,000 questionnaires were mailed to a random sample of DATAMATION subscribers.

The sample was limited to one name per site for those whose titles are within Corporate, Finance, and General Management. Names were selected in such a way as to include a representative sampling of both large and small companies (over and under 750 employees). The sample was drawn on an "nth-name" basis from those who qualified according to the above

criteria. That is, names were selected at a specified interval throughout the list in order to obtain a systematic random sample.

By December 2, 1988, 593 completed questionnaires had been received by the Cahners Publishing Market Research Department, indicating a response rate of 19.8%. The results were tabulated, and this report was written based on the data in these 593 surveys.

Payoffs Down the Pike: A CASE Study

A DATAMATION/Price Waterhouse survey shows that CASE pioneers will be rewarded with improved software quality—but first they must tailor a basically inflexible technology to their environments.

BY NORMAN STATLAND

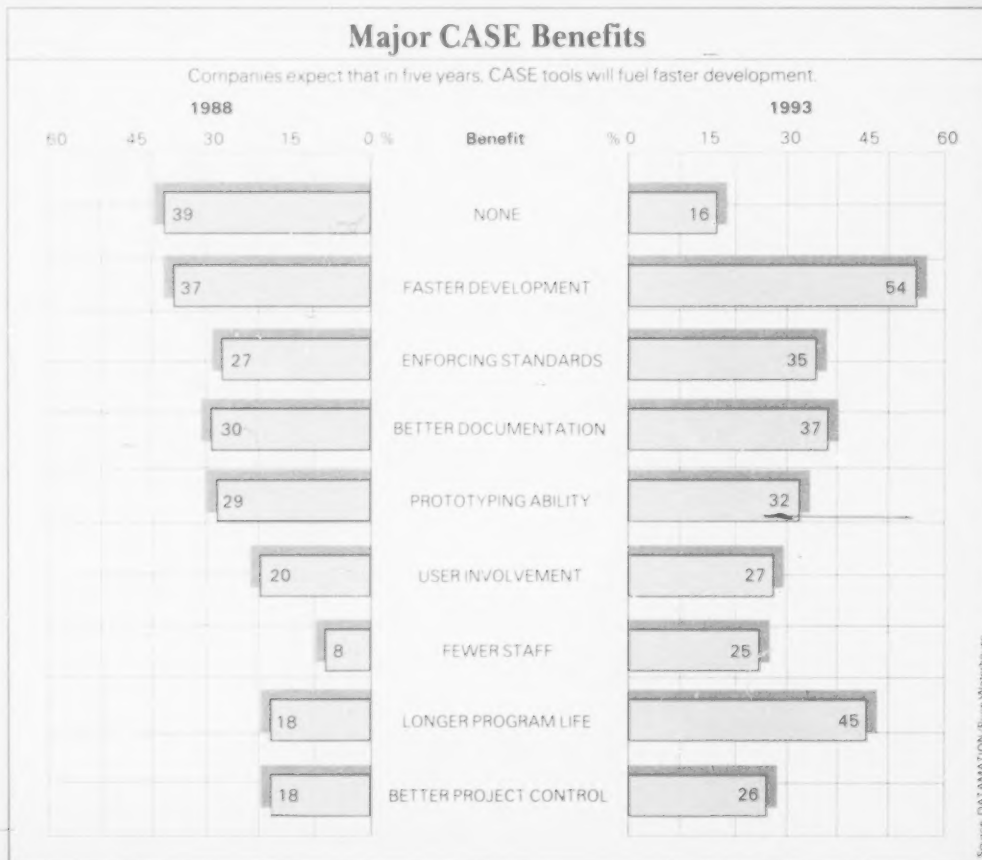
Improving
Software
Quality

Most of the pioneering U.S. companies that are just beginning to plug in computer-assisted software engineering (CASE) products see their payoffs coming in the future. The experience of these companies shows that in the short run, CASE tools have negligible effect on productivity. The main reason is that CASE technology must be used with a formal methodology

to be effective. The patience of those pioneers, however, promises to pay off three years down the road when CASE technology is expected to dramatically improve software quality. The improvements will stem directly from the decreased maintenance and increased productivity that will accrue over the total life of a system developed with CASE tools.

A special DATAMATION/Price Waterhouse opinion

CASE Benefits



CASE technology must be used with a formal methodology to be effective.

survey reveals that in most organizations CASE tools are only in the initial stages of implementation. In fact, our sample shows that the technology is currently affecting only one out of four installations in the U.S. But within the next three years, as it becomes more widespread, CASE is expected to impact one out of every two American organizations, according to our survey.

During the startup stage, expectations for CASE are relatively modest regarding productivity. Fifty-seven percent of the respondents say they didn't think CASE would have any effect on productivity; another 11% feel that the technology would actually have a negative effect on software development productivity.

Although most (68%) of the current users see no direct productivity improvements, they cite several CASE benefits that actually contribute to better productivity. Among the advantages are faster development and a more uniform level for interim products within the system development life cycle (SDLC). Therefore, it seems that within these organizations, productivity is being measured primarily in terms of total elapsed time in the software development process.

The productivity prognosis is considerably brighter over the longer term. Fifty-one percent of

the organizations sampled predict that CASE would spawn software productivity jumps of up to 100% over the next five years. Productivity surges of up to 200% by 1993 are foreseen by 20% of the CASE users surveyed.

Fifty-four percent of current CASE customers expect to see much quicker software development by 1993, as a result of the technology. The most marked difference between today and tomorrow comes in the maintenance area. A whopping 45% of the companies predict that within five years, longer program life would be the big plus of using CASE tools.

The reason for the expected program life extension lies in the level of decomposition that can be achieved via a CASE tool in the analysis and design stages of the SDLC. Today, most people are not using CASE for decomposition. This is reflected by our sample, which shows that only 18% of users expect longer program life as a result of CASE. Better project control and standards enforcement are also expected to be bigger benefits in another five years.

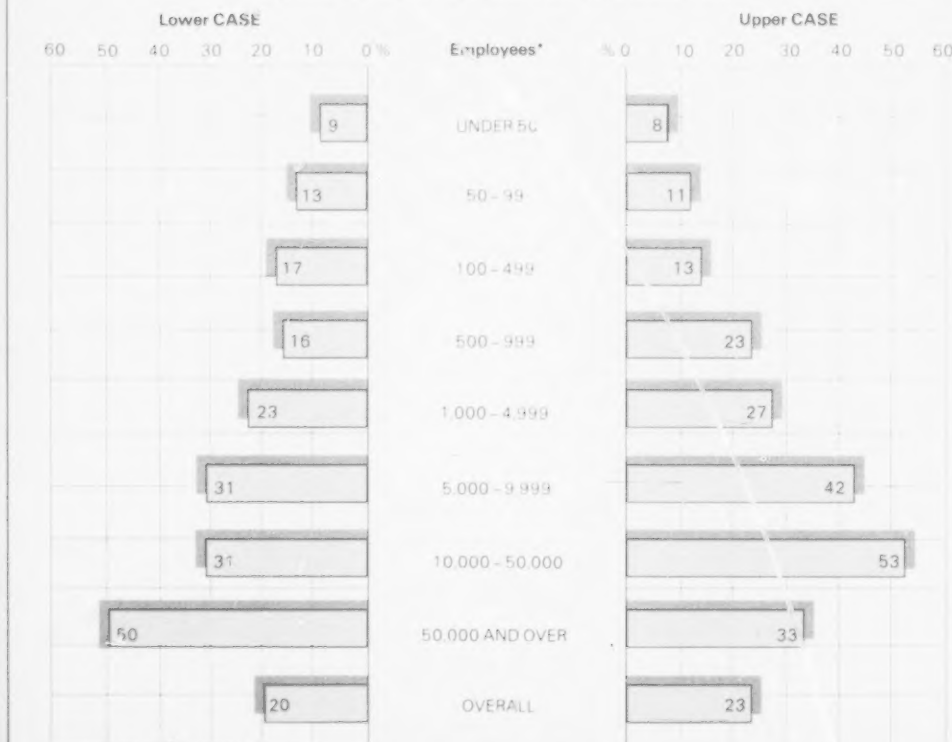
The case for CASE today shows a somewhat different picture. Organizations responding to the survey report that the current selling points of the technology are faster software development, improved documentation, and better standards enforcement.

continued on p. 52

Program Life Extension

CASE Tool Usage

Larger companies are most actively using upper CASE tools



*Measured by companies' employee count

Source: DATAMATION, Inc. Survey

Size Determines CASE Spending

TECHNOLOGY FORUM SOFTWARE DEVELOPMENT

Improving Software Development

continued from page 30

SEPGs consist of roughly 1% to 3% of an organization's software development professionals, with the practical minimum being four to five experienced people. Initially, group members should be recruited from within the organization to ensure that they have the necessary corporate knowledge and in-house technical expertise.

Organizations assessed by the SEI are given guidance to help them establish their own SEPGs. The SEI also promotes and supports these groups by sponsoring process workshops and symposia.

Today, SEPGs are not widespread except within the organizations evaluated by the SEI. These are the organizations that are achieving awareness of where they are and where they have to go in the complex software development process. Only by focusing on steady improvements in that vital process, will true software progress come. □

Watts S. Humphrey, who is director of the software process program at the SEI at Carnegie Mellon University, Pittsburgh, joined the Institute after logging 27 years at IBM as a software manager and executive. Some of the material for this article is based on his book, Managing the Software Process, to be published this May by Addison-Wesley Publishing Co., Inc., Reading, Mass.

Payoffs Down the Pike

continued from page 33

Twenty-nine percent like the fact that they could use CASE to provide a platform for prototyping. Users forecast that CASE's prototyping muscle will be even stronger by 1993, when screen painters and end-user reporting tools are incorporated within the CASE environment.

In conducting the survey, Price Waterhouse considered Upper CASE tools such as tools for analysis and design, Lower CASE tools for automated code generation, and integrated project support environment (IPSE) tools that integrate analysis, design, and construction tasks with project management facilities within the SDLC.

From the survey, it appears that the usage of CASE depends on a company's overall information technology budget. The bigger the budget, the more money that can be devoted to making the major investments in the training and in the methodology needed to implement Upper CASE tools.

It naturally follows then that the compa-

nies using Upper CASE are the same ones that have historically been pioneers in applying new technologies. Our survey indicates that those firms fall into the large- to midrange categories. In the context of this survey, the number of employees was used to establish company size.

Twenty-three percent of all survey respondents say they are using an Upper CASE tool; 25% plan to use one for analysis and design chores. Twelve percent of companies in the 5,000-to-10,000-employee bracket are using tools for analysis and design tasks within the SDLC, while another 28% have overall plans to deploy Upper CASE products.

In firms with under 500 employees, 70% have no plans to explore Upper CASE tools. This may be a reflection of the level of sophistication within the organizations. Or it may be that management's concern over system productivity has yet to surface within those particular organizations. In either case, the low usage of Upper CASE products in smaller companies is understandable because of the costs involved in implementing them.

Further along the CASE ladder, 32% of all companies note that they were currently working with integrated project management tools; 21% have plans to use them. Roughly 40% of interviewed companies that range in size from 1,000 to 10,000 employees are making use of automated project management tools. Another 30% of same size firms predict they will be plugging in these tools within the next 12 months. However, it's evident that to take full advantage of either Upper or Lower CASE tools, the existing software staff will have to be more extensively trained in the use of structured analysis and design formalisms.

Twenty percent of our sample report using Lower CASE products; another 26% indicate they are planning to. Half of the larger companies (with employee rosters of 10,000 to 50,000 people) are already applying Lower CASE wares. The slower implementation of Lower CASE may be related to the protracted acquisition process for these expensive tools. Also, there is mounting evidence that developers are experiencing frustration because of their unrealistic expectations that CASE will generate complete programs for all situations.

In conducting the study, Price Waterhouse asked companies for situations where they had rejected or not even considered CASE tools. The general rejection level was between 2% and 4%, indicating that among our sample there are very few firms that have tried and rejected CASE technology.

That doesn't mean CASE is trouble-free. Three main CASE problem areas are pointed up by the DATAMATION/Price Waterhouse survey: the extreme amount of hype generated by sales personnel and the press; the costs associated with bringing multiple single-user copies of Upper CASE tools into a synchronized data repository; and the frequent frustration of people who want to tailor the basically inflexible CASE tools to particular methodologies or standards already in place within an organization. □

Norman Statland, who is national director of information resource management services at Price Waterhouse, is the author of Controlling Software Development (John Wiley & Sons, New York, 1986).

From CASE to Software Factories

continued from page 36

there are two key issues that have to be resolved before further progress on Software Factories can be made. First, there must be acceptance of user interfaces. And, second, a commitment must be made to train software specialists in the complexities of large systems development projects and processes. Many of today's software developers in Europe and elsewhere lack the skills needed to take full advantage of the new and evolving software production environments. Fortunately, educational institutions are slowly responding to these needs.

Within a company, training costs are usually not factored into the total price of a CASE product. An integrated CASE system that supports a number of development tasks costs at least \$100,000. Even more expensive is the training for the new environment. For every employee trained, you can add another \$100,000 to the CASE price tag. This calculation is based upon the fact that a salaried employee is pulled off his regular, revenue-generating activities during the learning process. Nonetheless, in the long run, companies must make these intellectual investments if they hope to partake in the productivity gains promised by the Software Factories of tomorrow. □

Herbert Weber is a full professor of computer sciences at the University of Dortmund in West Germany. At the university, he is the leader of the software technology group that is spearheading European research efforts to create new software production environments. Also working on this article was Svein Borgersen, president of Princeton Global Technologies Inc., Princeton, N.J.

Cutting Through The CASE Hype

The French are investing the most in CASE tools, the Australians are optimistic, the Japanese remain skeptical, and the U.S. is looking for reverse engineering.

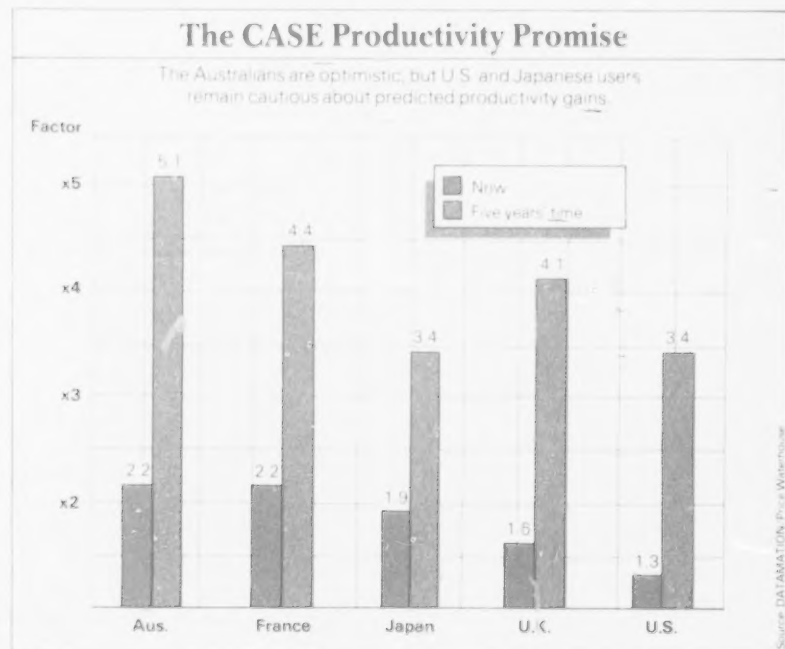
BY KIT GRINDLEY

Computer-Aided Software Engineering (CASE) is the latest offering in 30 years of promised panaceas for curing the pain of systems development. Still, meeting project deadlines remains the world's number one problem, and the delay in delivering programs, rather than any technical shortcomings, has become the single overriding constraint on IS progress.

Can CASE prove successful in remedying the problem? It should—eventually. CASE makes use of CAD/CAM techniques, which have already realized massive improvements in cutting through the layers of detail design that stand between the production engineer and his objectives.

What works for one branch of engineering should work for another. But not yet; not according to a recent DATAMATION and management consultants Price Waterhouse survey of over 3,000 IT executives in the U.S., Japan, Australia, France, and the U.K. The survey found that so far only 20% of installations worldwide are using the technique, 7% have tried and rejected it, and over 30% of the respondents feel the main problem is "cutting through the hype" of unsubstantiated claims for the products (see "Barriers to Success").

"Suggestions that just entering in corporate objectives through the screen will result in the automatic and effortless production of programs may get us to open the door to the brochures, but it won't have the same effect on our wallets," comments one respondent. French wallets seem to have succumbed to the sales pressure more than most however, and France leads the world in the automation of programming, with over a third of its installations claiming to use CASE tools in one shape or an-



other. This compares with only a fifth of installations using the techniques in the land of CASE skeptics—Japan.

CASE tools come in three distinct shapes: upper CASE, which helps the analyst discover and specify systems requirements; lower CASE, which aids and abets programming; and IPSE (integrated programming and systems engineering), which aims to automate the technical management task.

Upper CASE and IPSE can be bought relatively cheaply, so experimentation in these areas can be a low-cost project. But lower CASE, which typically generates

working COBOL programs, can knock a sizable hole in the IS budget, and it's hats off to France and the U.K., who are leading the world's investments in this area (see "Worldwide CASE Status").

Respondents perceive the main benefit of CASE to be improved productivity (see "The Productivity Promise"). The improvement being achieved worldwide by those using the technique today is an 84% cut in systems development delivery time. The best performers are Australia and France, who claim to have more than doubled their productivity. In five years time, most IS executives believe the technique

INTERNATIONAL WORLDWIDE CASE

Worldwide CASE Status

French companies lead the world's users in the global CASE stakes.

	(by percent)	Aus.	France	Japan	U.K.	U.S.
Upper CASE	Using now	16	30	9	22	23
	Plan to use	33	29	20	30	25
	Rejected	5	4	17	5	3
	Not yet considered	46	37	54	43	49
Lower CASE	Using now	17	36	21	27	21
	Planning to use	32	25	17	27	21
	Rejected	9	3	16	8	4
	Not yet considered	42	36	46	38	49
IPSE	Using now	31	23	3	27	32
	Plan to use	17	33	12	25	21
	Rejected	8	5	23	8	3
	Not yet considered	44	39	62	40	44

Source: DATAMATION/Price Waterhouse

Barriers to Success

Users rate cutting through the industry hype and choosing the right products as their biggest CASE problems.

	Aus.	France	Japan	U.K.	U.S.
Unintegrated systems (using standalone CASE)	2nd				
Choosing/assessing products	1st	1st	2nd	3rd	
Implementation			3rd		
Justifying the cost	2nd	3rd		1st	2nd
Cutting through the hype	3rd		1st	2nd	1st
Adapting to methods and standards					3rd

Source: DATAMATION/Price Waterhouse

Predicted CASE Payoffs

Asked to predict the shift in CASE benefits between now and 1994,* most users foresee increased improvements, except French and Japanese users. There is a decline in the percentage of French users who anticipate improved systems development with CASE, and of Japanese users who mention standards enforcement as a CASE benefit.

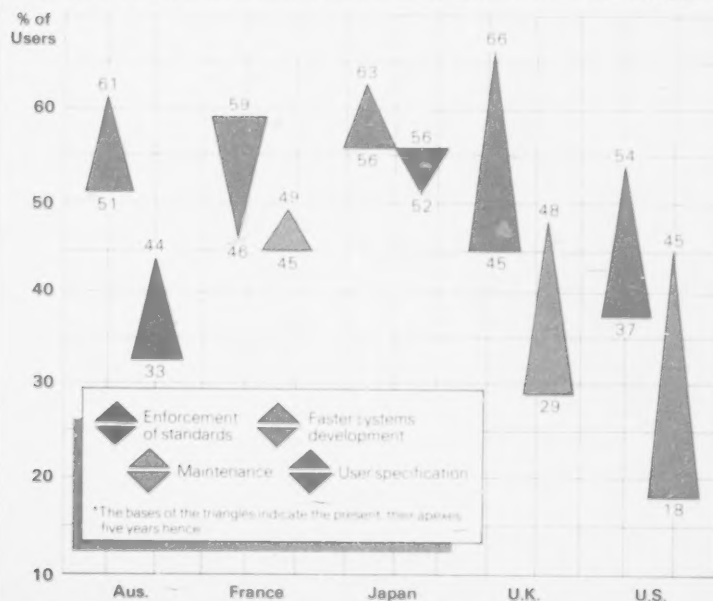


Chart by Catherine Francis

will come good however, with a world average expectation of a fourfold speedup in programming resulting from the use of CASE. Australians are the most optimistic, and have pinned their hopes on producing systems in less than a fifth of present delivery times.

French IT executives, who are among today's leaders in claims for improved productivity, reveal an interesting trend of future expectations. Fifty-nine percent of installations in France state the main benefit now is faster systems development (see "Predicted CASE Payoffs"). In five years' time, however, this figure will fall to 46%, and by then 49% expect the main benefit to be the increased life of programs developed using CASE tools, and the beginnings of a solution to the widespread problems of program maintenance.

Interviews revealed that many panelists feel the claims of increased productivity are just part of the sales hype, and that the initial programs developed under a CASE environment actually take longer to produce. "After installing upper CASE tools, we found that our systems analysts took longer to produce specifications, even after allowing for the learning curve," says one.

But while delivery times went up, so did user satisfaction. "The screen-based systems make flow-charting and systems design so fast that no one's inhibited from making changes anymore as they improve their ideas," adds another IS executive.

Cracking the program maintenance problem is stated as a main benefit of CASE by 29% of installations in the U.K. and 18% in the U.S. But these figures rise to near 50%, alongside France, when it comes to examining expectations of CASE for five years' time.

Interviews in the U.S., where the stranglehold on progress exercised by vast existing COBOL programs is the greatest in the world, also showed strong hopes for a fourth set of CASE tools—reverse-engineering products.

"Techniques already exist for feeding in code and getting out data models of what these programs are doing," points out one U.S.-based IS manager. "Once you stand the thing on its head in this way you have the possibility of feeding your existing programs in at the back, changing the data models you get out at the front, feeding them back in, and updating your systems automatically."

Kit Grindley is a management consultant for Price Waterhouse and professor of systems automation at the London School of Economics.

IS Operations: The Economy's Impact on Your Department

Cheering unemployment figures may mean difficulty in hiring programmers and analysts.

BY MADELINE FRANCHI

With the start of 1989, the U.S. entered its seventh year of uninterrupted economic growth. This longest peacetime expansion has moved people from the unemployment line to the assembly line, swelling the ranks of the employed.

Just within the period 1985 through 1988, civilian employment climbed to 115 million from about 107 million, an increase of 7%. In 1988, the U.S. unemployment rate averaged just 5.5%, a drop from over 7% in the mid '80s. In some areas of the country, the unemployment rate was even lower.

Continued (though slower) economic growth for 1989 and 1990, combined with a decline in the number of entry-level workers, means that the market for labor will get tight. For some occupations, and in certain geographic areas, the shortage of both skilled and unskilled workers is already pushing up wages or causing service cutbacks as job openings go unfilled. If you are a manager making staff decisions, you may have already experienced firsthand the effects of the labor crunch.

Of great interest, of course, is the em-

ployment and earnings outlook for computer and data processing professionals. In the last several years, employment of computer systems analysts was growing almost four times as fast as total employment. According to Bureau of Labor Statistics (BLS) data, employment of mathematical and computer scientists skyrocketed 28%, to about 730 thousand in 1988 from an average of 571.3 thousand persons in 1985, and it's still heading up. Right now, computer systems analysts make up about 45% of that occupational category.

Similarly, employment of technicians (excluding health, engineering, and science) multiplied to about 1,145.3 thousand in 1988 from an average of 1,025.5 thousand in 1985. That was a gain of close to 12%. Computer programmers comprise over 60% of the employment in the technicians' grouping.

Computer and data processing professionals are among the fastest growing occupations, in terms of both the actual number of jobs and the growth rate, based on BLS projections to the year 2000. By the turn of the century, 251 thousand more computer systems analysts and 335 thou-

sand more computer programmers will be needed than in 1986. These gains will be spurred by the ever-expanding applications for computers requiring more workers, particularly in the computer and data processing services industry.

Results of the 1987 BLS Wage Survey of the computer and data processing industry revealed that top-level systems analysts and systems programmers were the highest paid workers in the industry, with average pay generally in excess of \$800 a week. By metropolitan area, average weekly earnings of all levels of systems analysts ranged from about \$676 in Washington, D.C., up to \$860 in and around San Jose.

To help its executives, *Information Economics* reports on economic issues and trends that affect the running of your department. Once each quarter, *Information Economics* reports on the sales performance of the information technology industry in the U.S. Other quarterly reports deliver capsule summaries of the economic health of various industry sectors. More information can be obtained from *Cahners Economics Department*, 275 Washington St., Newton, MA 02158, (617) 964-3030.

Well-Paid Programmers and Analysts

Systems analysts and systems programmers are among the best-paid workers in the U.S.

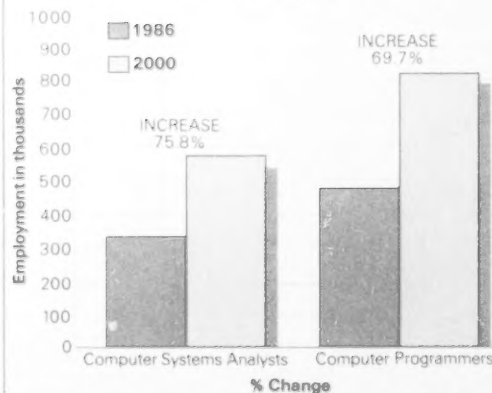
Average Weekly Earnings 1987*	Systems Analysts	Systems Programmers
San Jose	\$859.5	NA
Los Angeles-Long Beach	839.0	862.5
San Francisco	823.5	NA
Oakland	768.0	NA
Philadelphia	766.0	NA
Chicago	752.5	815.5
Denver	751.0	676.5
New York-Newark	744.0	695
Boston	743.0	NA
Cleveland	728.5	NA

*Selected metropolitan areas

Source: U.S. Department of Labor, Bureau of Labor Statistics, Bulletin 2318.

IS Occupations Are Among The Fastest Growing

Growth in these IS jobs will be fired by new computer applications.



Source: U.S. Department of Labor, Bureau of Labor Statistics
Chart by Paragraphics